

Application No. 10/656,696
Response dated September 14, 2006
Response to Office action dated June 15, 2006

Listing of Claims:

1. (Original) An inverter for a liquid crystal display, the inverter comprising:
an inverter controller generating a carrier signal for pulse width modulation and a lamp driving signal having on-time and off-time by pulse width modulating a dimming signal based on the carrier signal and controlling the on-time of the lamp driving signal in response to at least one of a vertical synchronization signal and a vertical synchronization start signal;
a power switching element selectively transmitting a DC voltage in response to a signal from the inverter controller; and
a voltage booster for driving a lamp in response to a signal from the switching element.
2. (Original) The inverter of claim 1, wherein the liquid crystal display comprises a signal controller for providing the vertical synchronization signal and the vertical synchronization start signal and the dimming signal is provided from the signal controller or an external device.
3. (Original) The inverter of claim 1, wherein the inverter controller comprises:
a control block for generating the carrier signal and the lamp driving signal;
a time constant setting block for determining time constant of the carrier signal; and
an initiation block for resetting the time constant given by the time constant setting block whenever pulses of the vertical synchronization signal are generated.
4. (Original) The inverter of claim 3, wherein the time constant setting block comprises a resistor and a capacitor connected between the dimming signal and a ground and provides a signal at a node between the resistor and the capacitor to the control block.
5. (Original) The inverter of claim 4, wherein the initiation block comprises a transistor having a collector connected to the node between the resistor and the capacitor of the time constant setting block, a grounded emitter, and a based supplied with the vertical synchronization signal via a resistor, the transistor turned on by the pulses of the vertical synchronization signal.

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6. (Withdrawn) An inverter for a liquid crystal display, the inverter comprising:
 an inverter controller generating a lamp driving signal having on-time and off-time, a carrier signal for pulse width modulation in synchronization with a horizontal synchronization signal, and an oscillating signal by pulse width modulating a reference signal based on the carrier signal;

a power switching element selectively transmitting a DC voltage in response to the oscillating signal from the inverter controller; and

a voltage booster for driving a lamp in response to a signal from the switching element.

7. (Withdrawn) The inverter of claim 6, wherein the liquid crystal display comprises a signal controller for providing the horizontal synchronization signal.

8. (Withdrawn) The inverter of claim 6, wherein the inverter controller comprises:
 a control block for generating the lamp driving signal, the carrier signal, and the oscillating signal;

a time constant setting block for determining time constant of the carrier signal; and

an initiation block for resetting the time constant given by the time constant setting block whenever pulses of the horizontal synchronization signal are generated.

9. (Withdrawn) The inverter of claim 8, wherein the time constant setting block comprises a resistor and a capacitor connected in series and provides a signal at a node between the resistor and the capacitor to the control block.

10. (Withdrawn) The inverter of claim 9, wherein the initiation block comprises a multivibrator regulating pulse width of the horizontal synchronization signal and a diode connected in reverse direction from the multivibrator to the node between the resistor and the capacitor of the time constant setting block, the diode turned on by the pulses of the horizontal synchronization signal.

11. (Withdrawn) An inverter for a liquid crystal display, the inverter comprising:

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an inverter controller generating first and second carrier signals for pulse width modulation, a lamp driving signal having on-time and off-time by pulse width modulating a dimming signal based on the first carrier signal, and an oscillating signal by pulse width modulating a reference signal based on the second carrier signal, and controlling the on-time of the lamp driving signal in response to pulses of at least one of a vertical synchronization signal and a vertical synchronization start signal;

a power switching element selectively transmitting a DC voltage in response to a signal from the inverter controller; and

a voltage booster for driving a lamp in response to a signal from the switching element.

12. (Withdrawn) The inverter of claim 11, wherein the liquid crystal display comprises a signal controller for providing the vertical synchronization signal, the vertical synchronization start signal, and the horizontal synchronization signal, and the dimming signal is provided from the signal controller or an external device.

13. (Original) The inverter of claim 1, wherein the inverter controller comprises:

a control block for generating the first and the second carrier signals, the lamp driving signal, and the oscillating signal;

first and second time constant setting blocks for determining time constant of the first and the second carrier signal;

a first initiation block for resetting the time constant given by the first time constant setting block whenever pulses of the vertical synchronization signal are generated; and

a second initiation block for resetting the time constant given by the second time constant setting block whenever pulses of the horizontal synchronization signal are generated.

14. (Original) The inverter of claim 13, wherein the first time constant setting block comprises a resistor and a capacitor connected between the dimming signal and a ground and provides a signal at a node between the resistor and the capacitor to the control block as the first carrier signal.

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15. (Original) The inverter of claim 14, wherein the first initiation block comprises a transistor having a collector connected to the node between the resistor and the capacitor of the time constant setting block, a grounded emitter, and a based supplied with the vertical synchronization signal via a resistor, the transistor turned on by the pulses of the vertical synchronization signal.

16. (Original) The inverter of claim 13, wherein the second time constant setting block comprises a resistor and a capacitor connected in series and provides a signal at a node between the resistor and the capacitor to the control block as the second carrier signal.

17. (Original) The inverter of claim 16, wherein the initiation block comprises a multivibrator regulating pulse width of the horizontal synchronization signal and a diode connected in reverse direction from the multivibrator to the node between the resistor and the capacitor of the time constant setting block, the diode turned on by the pulses of the horizontal synchronization signal.

18. (Withdrawn) An inverter for a liquid crystal display, the inverter comprising:
a triangular wave generator for generating a triangular wave using charging and discharging;
a reset block for resetting the generation of the triangular wave by the triangular wave generator whenever the pulses of the vertical synchronization start signal; and
a comparator for comparing a dimming signal with the triangular wave from the triangular wave generator and generating a pulse width modulated ("PWM") signal having on/off duty ratio.

19. (Withdrawn) The inverter of claim 18, wherein the triangular wave generator comprises:
a capacitor connected to a negative voltage for discharging path and providing an output voltage for the comparator;
a first transistor for selectively providing a positive voltage for the capacitor; and

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a first operational amplifier for turning off the first transistor when the output voltage of the capacitor is equal to or larger than a predetermined value and turning on the first transistor when the output voltage of the capacitor is smaller than the predetermined value.

20. (Withdrawn) The inverter of claim 19, wherein the reset block comprises a second transistor turned on to turn on the first transistor in response to the pulses of the vertical synchronization start signal.

21. (Withdrawn) The inverter of claim 20, wherein the first transistor includes a pnp bipolar transistor and the second transistor includes a npn bipolar transistor.

22. (Withdrawn) The inverter of claim 19, wherein the comparator comprises a second operational amplifier comparing the dimming signal with the output voltage of the capacitor and outputting a high value when the dimming signal is lower than the output voltage of the capacitor and a low value when the dimming signal is higher than the output voltage of the capacitor.

23. (Withdrawn) The inverter of claim 18, wherein the liquid crystal display comprises a signal controller for providing the vertical synchronization start signal, and the dimming signal is provided from the signal controller or an external device.

24. (Withdrawn) The inverter of claim 18, further comprising:
a power driver selectively transmitting a DC voltage in response to a signal from the comparator; and
a voltage booster for driving a lamp in response to a signal from the switching element.

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